

=> d acc 5688512 clm

US PAT NO: 5,688,512 [IMAGE AVAILABLE]

ANS: 1

CLAIMS:

CLMS(1)

We claim:

1. A vaccine comprising:  
substantially pure OspA; and  
an immunologically acceptable carrier or vehicle.

CLMS(2)

2. A method of inducing a protective immunological response against *Borrelia burgdorferi* in an animal or human susceptible to Lyme disease comprising administering the vaccine of claim 1 to the animal or human in an amount effective for inducing the protective immunological response.

CLMS(3)

3. Substantially pure OspA.

CLMS(4)

4. A method for producing a vaccine containing a substantially pure OspA protein comprising recovering the OspA protein from a host organism transformed with a vector containing DNA encoding the OspA protein, and admixing the OspA protein with an immunologically acceptable carrier or vehicle.

CLMS(5)

5. A method of producing the vaccine of claim 1 comprising admixing the OspA and the carrier or vehicle.

CLMS(6)

6. A method as claimed in claim 5 further comprising adding an adjuvant.

CLMS(7)

7. A vaccine comprising substantially pure OspA from two or more strains of *Borrelia burgdorferi* and an immunologically acceptable carrier or vehicle.

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PLEASE ENTER HOST PORT ID:
PLEASE ENTER HOST PORT ID:x
LOGINID:dl86slf
PASSWORD:
TERMINAL (ENTER 1, 2, 3, 4, OR ?):03
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FILE 'USPAT' ENTERED AT 11:48:54 ON 19 MAR 1998

SYSTEM:OS - DIALOG OneSearch

File 5:BIOSIS PREVIEWS(R) 1969-1997/Jun W4  
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File 40:Enviroline(R) 1975-1997/May  
(c) 1997 Congressional Information Service  
File 41:Pollution Abs 1970-1997/Jul  
(c) 1997 Cambridge Scientific Abstracts  
File 68:Env.Bib. 1974-1997/Aug  
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File 94:JICST-EPlus 1985-1997/May W3  
(c)1997 Japan Science and Tech Corp(JST)  
File 125:CLAIMS(R)/US PATENT APR 1997/JUN 24  
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(c) 1997 INIST/CNRS  
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File 156:Toxline(R) 1965-1997/Mar  
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File 305:Analytical Abstracts 1980-1997/Jul  
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File 348:EUROPEAN PATENTS FULLTEXT 1978-1997/JUN W4  
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\*File 348: Fulltext data available through \*1996\*. See HELP  
NEWS348. Over 75% of 1986-1996 records are fulltext. 1997  
forthcoming. File 351:DERWENT WPI  
1963-1997/UD=9726;UP=9723;UM=9720  
(c)1997 Derwent Info Ltd  
\*File 351: Excluded from Web promotion.  
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Royal Soc Chem & DECHEMA  
File 375:Derwent Drug Registry 1997-1997/Jul W1

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 File 377:Derwent Drug File 1983-1997/Jul W2  
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 (c) 1997 Inst for Sci Info  
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 (c) 1997 J.R. Prous, S.A.  
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 File 624:McGraw-Hill Publications 1985-1997/Jul 26  
 (c) 1997 McGraw-Hill Co. Inc  
 \*File 624: Please type 'E JN=' for all current journals available. Company names are now searchable using /CO and CO=.  
 File 10:AGRICOLA 70-1997/Jul  
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 (c) 1997 CAB International  
 File 77:Conference Papers Index 1973-1997/May  
 (c) 1997 Cambridge Sci Abs  
 File 344:Chinese Patents ABS Apr 1985-1997/Jul  
 (c) 1997 European Patent Office  
 File 347:JAPIO OCT 1976-1997/JAN.(UPDATED 970527)  
 (c) 1997 JPO & JAPIO  
 \*File 347: Records current through Kokai Number 09-028100

Set	Items	Description
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?		
s (ospA or osp(2w)a)		
Processing		
Processing		
Processing		
Processed	10 of 36 files	...
Processing		
Processing		
Processing		
Processed	20 of 36 files	...
Processing		
Processing		
Processing		
Processed	30 of 36 files	...
Processing		
Completed processing all files		
	2487	OSPA
	2484	OSP

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        50985419  A
          695  OSP(2W)A
S1      3059  (OSPA OR OSP(2W)A)
?
Processing
Processed 10 of 36 files ...
Processing
s s1(20n)(mucos? or oral? or intranas?)
Processed 20 of 36 files ...
Processing
Processing
Processing
Processed 30 of 36 files ...
Processing
Completed processing all files
        2487  OSPA
        2484  OSP
        50985419  A
          695  OSP(2W)A
S2      3059  (OSPA OR OSP(2W)A)
?
Processing
Processed 10 of 36 files ...
Processing
s s2 not py>1994
Processing
Processed 20 of 36 files ...
Processing
Processed 30 of 36 files ...
Processing
Completed processing all files
        3059  S1
        490780  MUCOS?
        1503443  ORAL?
        42873  INTRANAS?
S3      38  S1(20N)(MUCOS? OR ORAL? OR INTRANAS?)
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Processing
Processed 10 of 36 files ...
>>>One or more prefixes are unsupported
>>> or undefined in one or more files.
Processing
Processed 20 of 36 files ...
Processing
Processed 30 of 36 files ...
Completed processing all files
        3059  S2
        12869788  PY>1994
S4      1766  S2 NOT PY>1994
? display sets

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Set	Items	Description
S1	3059	(OSPA OR OSP(2W)A)

S2 3059 (OSPA OR OSP(2W)A)  
S3 38 S1(20N) (MUCOS? OR ORAL? OR INTRANAS?)  
S4 1766 S2 NOT PY>1994  
? rd s3

>>>Duplicate detection is not supported for File 125.  
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...completed examining records

S5 12 RD S3 (unique items)  
? t s5/3/1-12

5/3/1 (Item 1 from file: 5)  
DIALOG(R)File 5:BIOSIS PREVIEWS(R)  
(c) 1997 BIOSIS. All rts. reserv.

11635447 BIOSIS Number: 98235447  
Oral vaccination with an attenuated Salmonella typhimurium strain expressing Borrelia burgdorferi OspA prevents murine Lyme borreliosis Dunne M; Al-Ramadi B K; Barthold S W; Flavell R A; Fikrig E Pfizer Central Res., Eastern Point Road, Groton, CT 06340, USA Infection and Immunity 63 (4). 1995. 1611-1614.  
Full Journal Title: Infection and Immunity  
ISSN: 0019-9567  
Language: ENGLISH  
Print Number: Biological Abstracts Vol. 099 Iss. 011 Ref. 157623

5/3/2 (Item 2 from file: 5)  
DIALOG(R)File 5:BIOSIS PREVIEWS(R)  
(c) 1997 BIOSIS. All rts. reserv.

11156307 BIOSIS Number: 97356307  
Treatment of Lyme arthritis  
Steere A C; Levin R E; Molloy P J; Kalish R A; Abraham J H III; Liu N Y; Schmid C H  
New England Med. Cent., NEMC 406, 750 Washington St., Boston, MA 02111, USA  
Arthritis & Rheumatism 37 (6). 1994. 878-888.  
Full Journal Title: Arthritis & Rheumatism  
ISSN: 0004-3591  
Language: ENGLISH  
Print Number: Biological Abstracts Vol. 098 Iss. 004 Ref. 044796

5/3/3 (Item 3 from file: 5)  
DIALOG(R)File 5:BIOSIS PREVIEWS(R)  
(c) 1997 BIOSIS. All rts. reserv.

9043846 BIOSIS Number: 93028846  
PROTECTION OF MICE FROM LYME BORRELIOSIS BY ORAL VACCINATION  
WITH ESCHERICHIA-COLI EXPRESSING OSPA  
FIKRIG E; BARTHOLD S W; KANTOR F S; FLAVELL R A  
SECT. IMMUNOBIOLOG., YALE UNIV. SCH. MED., 429 FMB, 310 CEDAR  
ST., NEW HAVEN, CONN. 06510.  
J INFECT DIS 164 (6). 1991. 1224-1227. CODEN: JIDIA  
Full Journal Title: Journal of Infectious Diseases  
Language: ENGLISH

5/3/4 (Item 1 from file: 94)  
DIALOG(R)File 94:JICST-EPlus  
(c)1997 Japan Science and Tech Corp(JST). All rts. reserv.  
03068869 JICST ACCESSION NUMBER: 96A0388511 FILE SEGMENT:  
JICST-E A Case of Lyme Borreliosis Which Was Suspected to Be  
Caused by Borrelia japonica Infection in Shizuoka, Japan.  
MASUZAWA TOSHIYUKI (1); YANAGIHARA YASUTAKE (1); FUJITA HIROSHI  
(2) (1) Univ. of Shizuoka, Sch. of Pharm. Sci.; (2) Shizuoka  
Prefect. Gen. Hosp.  
Kansenshogaku Zasshi(Journal of the Japanese Association for  
Infectious Diseases), 1996, VOL.70,NO.3, PAGE.264-267, FIG.1,  
TBL.1, REF.16 JOURNAL NUMBER: Z0760AAY ISSN NO: 0387-5911  
UNIVERSAL DECIMAL CLASSIFICATION: 616.9  
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan  
DOCUMENT TYPE: Journal  
ARTICLE TYPE: Original paper  
MEDIA TYPE: Printed Publication

5/3/5 (Item 1 from file: 172)  
DIALOG(R)File 172:EMBASE Alert  
(c) 1997 Elsevier Science B.V. All rts. reserv.

00462066 EMBASE No: 97172784  
Oral delivery of purified lipoprotein OspA protects mice  
from systemic infection with Borrelia burgdorferi  
Luke C.J.; Huebner R.C.; Kasmiersky V.; Barbour A.G.  
C.J. Luke, Dept. of Microbiol./Molec. Genetics, University of  
California, Irvine, CA 92697-4025 USA  
Vaccine (United Kingdom) , 1997  
VOL/ISS/PAGE: 15/6-7 (739-746) CODEN: VACCD ISSN: 0264-410X  
PUBLISHER ITEM IDENTIFIER: S0264410X9700219  
LANGUAGES: English SUMMARY LANGUAGES: English

5/3/6 (Item 1 from file: 173)  
DIALOG(R)File 173:Adis LMS Drug Alerts  
(c) 1997 Adis International Ltd. All rts. reserv.

00529444                    800540641  
TITLE:                    Oral delivery of purified lipoprotein OspA  
protects mice                    from systemic infection with  
Borrelia burgdorferi. AUTHOR:                    Luke C J; Huebner R C;  
Kasmiersky V; et al JOURNAL:                    Vaccine (Vaccine) 15:  
739-746, Apr-May 1997. PUBLICATION DATE: 1 May 1997 (19970501)  
LANGUAGE:                    English  
ADIS LMS:                    Vaccines (Index only): Alert no. 7, 1997 RECORD  
TYPE:                    Citation  
DOCUMENT TYPE:                    Animal

DESCRIPTORS:                    Lyme-disease-vaccine, immunogenicity;  
Lyme-disease;                    Research-and-development

5/3/7                    (Item 2 from file: 173)  
DIALOG(R) File 173:Adis LMS Drug Alerts  
(c) 1997 Adis International Ltd. All rts. reserv.

00340350                    807074351  
TITLE:                    Oral vaccination with an attenuated Salmonella  
                         typhimurium strain expressing Borrelia  
burgdorferi OspA                    prevents murine lyme  
borreliosis.  
AUTHOR:                    Dunne M; al Ramadi B K; Barthold S W; et al  
JOURNAL:                    Infection and Immunity (Infect-Immun) 63:  
1611-1614, Apr                    1995.  
PUBLICATION DATE: 1 April 1995 (19950401)  
LANGUAGE:                    English  
ADIS LMS:                    Vaccines (Index only): Alert no. 8, 1995 RECORD  
TYPE:                    Citation  
DOCUMENT TYPE:                    Animal

DESCRIPTORS:                    Lyme-arthritis; Lyme-disease-vaccine,  
pharmacodynamics;                    Research-and-development

5/3/8                    (Item 3 from file: 173)  
DIALOG(R) File 173:Adis LMS Drug Alerts  
(c) 1997 Adis International Ltd. All rts. reserv.

00308876                    800323613  
TITLE:                    Systemic and mucosal immunity induced by BCG  
vector                    expressing outer-surface protein A of  
Borrelia                    burgdorferi.  
AUTHOR:                    Langermann S; Palaszynski S; Sadziene A; Stover  
C K;                    Koenig S  
JOURNAL:                    Nature (Nature) 372: 552-555, 8 Dec 1994.  
PUBLICATION DATE: 8 December 1994 (19941208)  
LANGUAGE:                    English  
ADIS LMS:                    Vaccines (Summary): Alert no. 2, 1995  
RECORD TYPE:                    Summary  
DOCUMENT TYPE:                    Animal



DESCRIPTORS: Biotechnology; Lyme-disease-vaccine,  
immunogenicity; Research-and-development

5/3/9 (Item 1 from file: 377)  
DIALOG(R) File 377: Derwent Drug File  
(c) 1997 Derwent Info Ltd. All rts. reserv.

00620253 DERWENT ACCESSION NUMBER: 95-01917  
Systemic and mucosal immunity induced by BCG vector expressing  
outer-surface protein A of *Borrelia burgdorferi*.  
Langermann S; Palaszynski S; Sadziene A; Stover C K; Koenig S  
Medimmune Univ. Texas (Gaithersburg, Md.; San Antonio, Tex., USA)  
Nature 372, No. 6506, 552-55, 1994

5/3/10 (Item 1 from file: 434)  
DIALOG(R) File 434: Scisearch(R) Cited Ref Sci  
(c) 1997 Inst for Sci Info. All rts. reserv.

14126220 Genuine Article#: RR203 No. References: 33  
Title: THE OUTER SURFACE-PROTEINS OF LYME-DISEASE BORRELIA  
SPIROCHETES STIMULATE T-CELLS TO SECRETE INTERFERON-GAMMA  
(IFN-GAMMA) - DIAGNOSTIC AND PATHOGENIC IMPLICATIONS  
Author(s): FORSBERG P; ERNERUDH J; EKERFELT C; ROBERG M; VRETHEM  
M; BERGSTROM S  
Corporate Source: LINKOPING UNIV HOSP, FAC HLTH SCI, DEPT INFECT  
DIS/S-58185 LINKOPING//SWEDEN/; LINKOPING UNIV HOSP, FAC HLTH  
SCI, DEPT NEUROL/S-58185 LINKOPING//SWEDEN/; LINKOPING UNIV  
HOSP, FAC HLTH SCI, DEPT CLIN IMMUNOL & TRANSFUS MED/S-58185  
LINKOPING//SWEDEN/; UMEA UNIV, DEPT MICROBIOL/UMEA//SWEDEN/  
Journal: CLINICAL AND EXPERIMENTAL IMMUNOLOGY, 1995, V101, N3  
(SEP), P 453-460  
ISSN: 0009-9104  
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

5/3/11 (Item 2 from file: 434)  
DIALOG(R) File 434: Scisearch(R) Cited Ref Sci  
(c) 1997 Inst for Sci Info. All rts. reserv.

13774074 Genuine Article#: QP134 No. References: 58  
Title: DERMAL INFLAMMATION ELICITED BY SYNTHETIC ANALOGS OF  
TREPONEMA-PALLIDUM AND BORRELIA-BURGDORFERI LIPOPROTEINS  
Author(s): NORGARD MV; RILEY BS; RICHARDSON JA; RADOLF JD  
Corporate Source: UNIV TEXAS, SW MED CTR, DEPT MICROBIOL, 5323  
HARRYHINES BLVD/DALLAS//TX/75235; UNIV TEXAS, SW MED CTR, DEPT  
PATHOL/DALLAS//TX/75235; UNIV TEXAS, SW MED CTR, DEPT INTERNAL  
MED/DALLAS//TX/75235  
Journal: INFECTION AND IMMUNITY, 1995, V63, N4 (APR), P1507-1515  
ISSN: 0019-9567  
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

5/3/12 (Item 1 from file: 35)  
DIALOG(R)File 35:Dissertation Abstracts Online  
(c) 1997 UMI. All rts. reserv.

01213335 ORDER NO: AAD92-11404  
DETECTION OF SPECIES-SPECIFIC DNA SEQUENCES OF BORRELIA  
BURGDORFERI IN INFECTED HUMANS, ANIMAL RESERVOIRS, AND IXODID  
TICK VECTORS (LYME DISEASE) Author: MALLOY, DIANE CATHERINE  
Degree: PH.D.  
Year: 1992  
Corporate Source/Institution: UNIVERSITY OF MARYLAND BALTIMORE  
PROFESSIONAL SCHOOLS (0373)  
Source: VOLUME 52/11-B OF DISSERTATION ABSTRACTS  
INTERNATIONAL. PAGE 5673. 164 PAGES  
? t s5/5/2

5/5/2 (Item 2 from file: 5)  
DIALOG(R)File 5:BIOSIS PREVIEWS(R)  
(c) 1997 BIOSIS. All rts. reserv.

11156307 BIOSIS Number: 97356307  
Treatment of Lyme arthritis  
Steere A C; Levin R E; Molloy P J; Kalish R A; Abraham J H III;  
Liu N Y; Schmid C H  
New England Med. Cent., NEMC 406, 750 Washington St., Boston,  
MA 02111, USA  
Arthritis & Rheumatism 37 (6). 1994. 878-888.  
Full Journal Title: Arthritis & Rheumatism  
ISSN: 0004-3591  
Language: ENGLISH  
Print Number: Biological Abstracts Vol. 098 Iss. 004 Ref.  
044796 Objective. To test treatment regimens for Lyme  
arthritis. Methods. Patients were randomly assigned to  
treatment with doxycycline or amoxicillin plus probenecid  
for 30 days. Patients who had persistent arthritis for at  
least 3 months after treatment with oral antibiotics or  
parenteral penicillin were given intravenous ceftriaxone  
for 2 weeks. Results. Eighteen of the 20 patients treated with  
doxycycline and 16 of the 18 patients who completed the  
amoxicillin regimen had resolution of the arthritis within 1-3  
months after study entry. However, neuroborreliosis later  
developed in 5 patients, 4 of whom had received the  
amoxicillin regimen. Of 16 patients (2 from the oral antibiotic  
study and 14 additional patients) who had persistent arthritis  
despite previous oral antibiotics or parenteral penicillin, none  
had resolution of the arthritis within 3 months after ceftriaxone  
therapy. The HLA-DR4 specificity and OspA reactivity were  
associated with a lack of response. Conclusion. Lyme arthritis  
can usually be treated successfully with oral antibiotics,  
but patients may still develop neuroborreliosis. Patients with  
certain genetic and immune markers may have persistent  
arthritis despite treatment with oral or intravenous antibiotics.  
Descriptors/Keywords: RESEARCH ARTICLE; BORRELIA BURGDORFERI;

HUMAN; DOXYCYCLINE; ANTIBACTERIAL-DRUG; AMOXICILLIN;  
ANTIBACTERIAL-DRUG; CEFTRIAXONE; ANTIBACTERIAL-DRUG; EFFICACY;  
LYME DISEASE

Concept Codes:

\*12508 Pathology, General and Miscellaneous-Inflammation and  
Inflammatory Disease  
\*12512 Pathology, General and Miscellaneous-Therapy (1971- )  
\*18006 Bones, Joints, Fasciae, Connective and Adipose  
Tissue-Pathology \*22005 Pharmacology-Clinical Pharmacology  
(1972- )  
\*22012 Pharmacology-Connective Tissue, Bone and  
Collagen-Acting Drugs \*36002 Medical and Clinical  
Microbiology-Bacteriology  
\*38504 Chemotherapy-Antibacterial Agents  
10060 Biochemical Studies-General

Biosystematic Codes:

06112 Spirochaetaceae (1992- )  
86215 Hominidae

Super Taxa:

Microorganisms; Bacteria; Eubacteria; Animals; Chordates;  
Vertebrates; Mammals; Primates; Humans  
?

? t s5/5/12

5/5/12 (Item 1 from file: 35)  
DIALOG(R)File 35:Dissertation Abstracts Online  
(c) 1997 UMI. All rts. reserv.

01213335 ORDER NO: AAD92-11404  
DETECTION OF SPECIES-SPECIFIC DNA SEQUENCES OF BORRELIA  
BURGDORFERI IN INFECTED HUMANS, ANIMAL RESERVOIRS, AND IXODID  
TICK VECTORS (LYME DISEASE) Author: MALLOY, DIANE CATHERINE  
Degree: PH.D.  
Year: 1992  
Corporate Source/Institution: UNIVERSITY OF MARYLAND BALTIMORE  
PROFESSIONAL SCHOOLS (0373)  
Director: ROBERT K. NAUMAN  
Source: VOLUME 52/11-B OF DISSERTATION ABSTRACTS  
INTERNATIONAL. PAGE 5673. 164 PAGES  
Descriptors: BIOLOGY, MOLECULAR; BIOLOGY, MICROBIOLOGY; HEALTH  
SCIENCES, PUBLIC HEALTH  
Descriptor Codes: 0307; 0410; 0573

Segments of the ospA gene that encode hydrophobic regions of  
the outer membrane protein, OspA, of Borrelia burgdorferi strain  
B31 were synthesized for use as oligonucleotide primers in the  
polymerase chain reaction (PCR). These oligonucleotide primers  
flank a 309-base-pair segment within the ospA gene. Optimal  
amplification conditions were achieved in a reaction mixture  
containing 0.2 uM of each oligonucleotide primer and 2  
mMMgCl<sub>2</sub>. Dimethyl sulfoxide at a concentration of 10% or  
higher was found to inhibit amplification and gelatin had no

effect at concentrations below 100 ug/ml, and slight inhibition was seen at concentrations higher than 100 ug/ml. After 30 cycles of amplification under optimal conditions, the target fragment could be detected by agarose gel electrophoresis or dot hybridization with a  $^{32}$ P- or digoxigenin-labeled probe. This segment was amplified in all strains of *B. burgdorferi*, but it was not detected in other bacterial species. The sensitivity of PCR for the detection of *B. burgdorferi* in clinical samples was evaluated by seeding blood and urine specimens with *B. burgdorferi* and subjecting them to amplification. Ten organisms per ml of blood or urine could be detected using PCR with dot hybridization detection. In a blinded study of Lyme disease patients, the OspA PCR was positive in 31% of patients who were early in disease and who had not received oral antibiotic therapy. No patient who had received antibiotics was positive in the PCR. Blood and urine specimens were obtained from canines with clinical and serologic evidence of Lyme disease and subjected to PCR analysis. Of 17 clinical specimens from 15 canines, one blood specimen showed reactivity in the PCR. Two of 32 cerebrospinal fluid specimens from suspected neuroborreliosis patients showed reactivity in the PCR. *B. burgdorferi* could be detected optimally in tissue only after DNA extraction. Nine of ten mice from a highly endemic Lyme disease area in Wisconsin showed reactivity in the PCR when DNA extracted from heart, kidney, or bladder was used as the target. Two of five punch biopsy tissue samples from skin lesions from suspected Lyme disease patients showed reactivity in the PCR. Of all tissues studied, one yielded a positive spirochete stain and all were negative by immunoperoxidase staining with a polyclonal antibody to *B. burgdorferi*. The conclusion of this study is that PCR can detect and identify *B. burgdorferi* in clinical samples from Lyme disease with greater sensitivity than any other currently available method and that this tool can be used to detect the spirochete in tick and animal reservoirs.

? display sets

Set	Items	Description
S1	3059	(OSPA OR OSP(2W)A)
S2	3059	(OSPA OR OSP(2W)A)
S3	38	S1(20N) (MUCOS? OR ORAL? OR INTRANAS?)
S4	1766	S2 NOT PY>1994
S5	12	RD S3 (unique items)

? s s4(30n)oral?

Processed 10 of 36 files ...  
Processing  
Processed 30 of 36 files ...  
Processing  
Completed processing all files  
1766 S4  
1503443 ORAL?  
S6 18 S4(30N)ORAL?  
? t s6/6/1-18

6/6/1 (Item 1 from file: 5)  
11156307 BIOSIS Number: 97356307  
Treatment of Lyme arthritis  
Print Number: Biological Abstracts Vol. 098 Iss. 004 Ref.  
044796

6/6/2 (Item 2 from file: 5)  
9043846 BIOSIS Number: 93028846  
PROTECTION OF MICE FROM LYME BORRELIOSIS BY ORAL VACCINATION  
WITH ESCHERICHIA-COLI EXPRESSING OSP A

6/6/3 (Item 1 from file: 73)  
9241201 EMBASE No: 94188762  
Treatment of Lyme arthritis

6/6/4 (Item 2 from file: 73)  
8347903 EMBASE No: 92022159  
Protection of mice from lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA

6/6/5 (Item 1 from file: 76)  
01834923 3622346  
Treatment of Lyme arthritis

6/6/6 (Item 2 from file: 76)  
01536258 2634889  
Protection of mice from lyme borreliosis by oral vaccination with  
Escherichia coli expressing OspA.

6/6/7 (Item 1 from file: 144)  
10569098 PASCAL No.: 93-0078350  
Protection of mice from lyme borreliosis by oral vaccination  
with Escherichia coli expressing OspA

6/6/8 (Item 1 from file: 155)  
07940350 94271287  
Treatment of Lyme arthritis.

6/6/9 (Item 2 from file: 155)  
06874301 92065008  
Protection of mice from Lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA.

6/6/10 (Item 1 from file: 156)  
02456955 Subfile: TOXBIB-94-271287

Treatment of Lyme arthritis.

6/6/11 (Item 1 from file: 173)  
00308876 800323613  
TITLE: Systemic and mucosal immunity induced by BCG  
vector expressing outer-surface protein A of  
Borrelia burgdorferi.

6/6/12 (Item 1 from file: 377)  
00468242 DERWENT ACCESSION NUMBER: 92-08732  
Protection of Mice from Lyme Borreliosis by Oral Vaccination with  
Escherichia coli Expressing OspA.

6/6/13 (Item 1 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.

Protection of mice from lyme borreliosis by oral vaccination  
with Escherichia coli expressing OspA

6/6/14 (Item 1 from file: 434)  
13521788 Genuine Article#: PW082 Number of References: 26  
Title: SYSTEMIC AND MUCOSAL IMMUNITY INDUCED BY BCG VECTOR  
EXPRESSING OUTER-SURFACE PROTEIN-A OF BORRELIA-BURGDORFERI  
(Abstract Available)

6/6/15 (Item 2 from file: 434)  
13116461 Genuine Article#: NP654 Number of References: 34  
Title: TREATMENT OF LYME ARTHRITIS (Abstract Available)

6/6/16 (Item 3 from file: 434)  
11224104 Genuine Article#: GR660 Number of References: 10  
Title: PROTECTION OF MICE FROM LYME BORRELIOSIS BY ORAL  
VACCINATION WITH ESCHERICHIA-COLI EXPRESSING OSP A (Abstract  
Available)

6/6/17 (Item 1 from file: 35)  
01213335 ORDER NO: AAD92-11404  
DETECTION OF SPECIES-SPECIFIC DNA SEQUENCES OF BORRELIA  
BURGDORFERI IN INFECTED HUMANS, ANIMAL RESERVOIRS, AND IXODID  
TICK VECTORS (LYME DISEASE)

6/6/18 (Item 1 from file: 50)  
02600148 CAB Accession Number: 920511740  
Protection of mice from Lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA.  
? t s6/5/11,17

6/5/11 (Item 1 from file: 173)

DIALOG(R) File 173:Adis LMS Drug Alerts  
(c) 1997 Adis International Ltd. All rts. reserv.

00308876                    800323613  
TITLE:                    Systemic and mucosal immunity induced by BCG  
vector                    expressing outer-surface protein A of  
Borrelia                    burgdorferi.  
AUTHOR:                    Langermann S; Palaszynski S; Sadziene A; Stover  
C K;                    Koenig S  
CORPORATE SOURCE: MedImmune, Gaithersburg, Maryland, USA.  
JOURNAL:                    Nature (Nature) 372: 552-555, 8 Dec 1994.  
PUBLICATION DATE: 8 December 1994 (19941208)  
LANGUAGE:                    English  
ADIS TITLE:                    Lyme disease vaccine: immunogenicity.  
Intranasal                    administration of BCG expressing  
OspA of Borrelia                    burgdorferi induces both  
systemic and mucosal immunity                    Animal study.  
ADIS LMS:                    Vaccines (Summary): Alert no. 2, 1995  
RECORD TYPE:                    Summary  
DOCUMENT TYPE:                    Animal

SUMMARY TEXT:

Purpose:

Results from a previous study have shown that parenteral administration of recombinant BCG expressing Borrelia burgdorferi outer surface protein A (rBCG-OspA)  $2 \times 10^6$  cfu induced high levels of protective anti-OspA IgG antibodies (Stover CK, et al. Journal of Experimental Medicine 178: 197-209, 1 Jul 1993). The present study examined the systemic and mucosal immunogenicity of intranasal administration of this Lyme disease vaccine (R&D; MedImmune) in mice.

Author comments:

'We conclude that intranasal delivery of rBCG-OspA results in a potent, long-lasting systemic antibody response and a strong, pan-mucosal secretory IgA response to the vaccine. Although OspA was chosen as a model antigen to evaluate induction of immune responses following mucosal delivery of rBCG, we recognize that B. burgdorferi does not infect through a mucosal surface. Nonetheless, our findings are significant in that they demonstrate that i.n. (intranasal) immunization with rBCG can elicit complete protection against systemic infection by the native organism expressing that same antigen, while inducing a sustained mucosal immune response. It remains to be determined whether mucosal immunization with rBCG expressing an antigen from a mucosal pathogen can protect against infection at a mucosal site.' Study details:

Design: in vivo

Subjects:

Type: animals

Vaccine: Lyme disease vaccine (rBCG-OspA)

Results table:

-----  
---                    Untreated Non-rBCG                    rBCG-OspA vaccine

	control	intranasal		
administration intranasal			intraperitoneal	
		administration	administration	
--- In vitro	1 : 64	< 1 : 8	1 : 32 768	1 : 16
384 growth inhibition titre against B. burgdorferi Positive infection after ID challenge with B. burgdorferi (animals):				
plasma	1/7	3/7	0/7	0/7
heart	3/7	3/7	0/7	0/7
bladder	7/7	7/7	0/7	0/7
tibiotarsal joint	6/7	6/7	0/7	0/7

--- Non-rBCG = BCG lacking the recombinant vector.

Intranasal administration of rBCG-OspA  $2 \times 10^8$  cfu resulted in a similar systemic IgG response to that observed with IP administration of a  $2 \times 10^6$  cfu dose. A comparable immune response was reached with intranasal administration of a  $2 \times 10^6$  cfu dose, but the time to peak response was delayed by 4-6 weeks.

In contrast to administration via the IP route, intranasal administration of rBCG-OspA induced a highly sustained, low titre serum IgA response against OspA. High levels of OspA- and BCG-specific IgA spot forming cells (SFC) were observed in the lungs from 6-22 weeks. These results suggest a strong secretory IgA response. Neither OspA- nor BCG-specific SFC were observed after IP administration. Intranasal administration also resulted in high levels of OspA-specific IgA SFC in GI lamina propria mononuclear cells and in vaginal washes. Oral administration of rBCG  $10^7$  cfu induced low levels of OspA-specific systemic IgG and low levels of antigen-specific IgA in the GI tract.

Analysis of lung tissue of intranasally immunised mice showed discrete foci of lymphocytic infiltrates containing a mixture of monocytes, macrophages, activated lymphocytes and plasma cells. There was no evidence of fibrosis or granuloma formation over a 22-week period. There was a 3-fold increase in the level of B cells in the lungs of mice immunised with intranasal rBCG or non-rBCG compared with mice immunised IP or not treated. There were no significant increases in CD4+ or CD8+ cells in the lungs



of intranasally immunised mice compared with untreated or IP-immunised mice. CD4 : CD8 ratios were similar in all groups.

In intranasally immunised mice, Peyer's patches from the GI tract had lymphoid accumulations in follicles underlying the domed epithelium and lymphocyte infiltrates were observed in the lamina propria and muscularis mucosa. Lymphoid accumulations were also observed in the nasopharyngeal-associated lymphoid tissue; comparable aggregates were not observed in untreated or IP-immunised mice.

BCG persisted in the lungs and spleen for at least 9 weeks post-immunisation in mice immunised with intranasal rBCG-OspA, while those receiving IP immunisation had BCG located only in the spleen at 9 weeks.

DESCRIPTORS: Biotechnology; Lyme-disease-vaccine,  
immunogenicity; Research-and-development

6/5/17 (Item 1 from file: 35)  
DIALOG(R) File 35:Dissertation Abstracts Online  
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01213335 ORDER NO: AAD92-11404

DETECTION OF SPECIES-SPECIFIC DNA SEQUENCES OF BORRELIA  
BURGDORFERI IN INFECTED HUMANS, ANIMAL RESERVOIRS, AND Ixodid  
TICK VECTORS (LYME DISEASE) Author: MALLOY, DIANE CATHERINE

Degree: PH.D.

Year: 1992

Corporate Source/Institution: UNIVERSITY OF MARYLAND BALTIMORE  
PROFESSIONAL SCHOOLS (0373)

Director: ROBERT K. NAUMAN

Source: VOLUME 52/11-B OF DISSERTATION ABSTRACTS  
INTERNATIONAL. PAGE 5673. 164 PAGES

Descriptors: BIOLOGY, MOLECULAR; BIOLOGY, MICROBIOLOGY; HEALTH  
SCIENCES, PUBLIC HEALTH

Descriptor Codes: 0307; 0410; 0573

Segments of the ospA gene that encode hydrophobic regions of the outer membrane protein, OspA, of *Borrelia burgdorferi* strain B31 were synthesized for use as oligonucleotide primers in the polymerase chain reaction (PCR). These oligonucleotide primers flank a 309-base-pair segment within the ospA gene. Optimal amplification conditions were achieved in a reaction mixture containing 0.2 uM of each oligonucleotide primer and 2 mM MgCl<sub>2</sub>. Dimethyl sulfoxide at a concentration of 10% or higher was found to inhibit amplification and gelatin had no effect at concentrations below 100 ug/ml, and slight inhibition was seen at concentrations higher than 100 ug/ml. After 30 cycles of amplification under optimal conditions, the target fragment could be detected by agarose gel electrophoresis or dot hybridization with a <sup>32</sup>P- or digoxigenin-labeled probe. This segment was amplified in all strains of *B. burgdorferi*, but it was not detected in other bacterial species. The sensitivity of PCR for the detection of *B. burgdorferi* in clinical samples was evaluated by seeding blood and urine specimens with *B.*

burgdorferi and subjecting them to amplification. Ten organisms per ml of blood or urine could be detected using PCR with dot hybridization detection. In a blinded study of Lyme disease patients, the OspA PCR was positive in 31% of patients who were early in disease and who had not received oral antibiotic therapy. No patient who had received antibiotics was positive in the PCR. Blood and urine specimens were obtained from canines with clinical and serologic evidence of Lyme disease and subjected to PCR analysis. Of 17 clinical specimens from 15 canines, one blood specimen showed reactivity in the PCR. Two of 32 cerebrospinal fluid specimens from suspected neuroborreliosis patients showed reactivity in the PCR. B. burgdorferi could be detected optimally in tissue only after DNA extraction. Nine of ten mice from a highly endemic Lyme disease area in Wisconsin showed reactivity in the PCR when DNA extracted from heart, kidney, or bladder was used as the target. Two of five punch biopsy tissue samples from skin lesions from suspected Lyme disease patients showed reactivity in the PCR. Of all tissues studied, one yielded a positive spirochete stain and all were negative by immunoperoxidase staining with a polyclonal antibody to B. burgdorferi. The conclusion of this study is that PCR can detect and identify B. burgdorferi in clinical samples from Lyme disease with greater sensitivity than any other currently available method and that this tool can be used to detect the spirochete in tick and animal reservoirs.

? expand au=luke, c. j.

Ref	Items	Index-term
E1	1	*AU=LUKE, C. J.
E2	3	AU=LUKE, C. L.
E3	1	AU=LUKE, C. M.
E4	6	AU=LUKE, C.A.
E5	1	AU=LUKE, C.F.
E6	3	AU=LUKE, C.J.
E7	1	AU=LUKE, C.M.
E8	13	AU=LUKE, CAROL A.
E9	1	AU=LUKE, CARTER
E10	1	AU=LUKE, CATHERINE ANNE
E11	1	AU=LUKE, CATHERINE J
E12	3	AU=LUKE, CATHERINE J.

Enter P or PAGE for more

? s e1, e6, e11, e12

>>>One or more prefixes are unsupported  
>>> or undefined in one or more files.

	1	AU=LUKE, C. J.
	3	AU=LUKE, C.J.
	1	AU=LUKE, CATHERINE J
	3	AU=LUKE, CATHERINE J.
S7	8	E1, E6, E11, E12

? t s7/6/1-8

7/6/1 (Item 1 from file: 76)  
02121662 4026396  
An OspA-based DNA vaccine protects mice against infection with  
Borrelia burgdorferi

7/6/2 (Item 2 from file: 76)  
02030670 3903038  
Identification of a 29 kDa flagellar sheath protein in  
Helicobacter pylori using a murine monoclonal antibody

7/6/3 (Item 3 from file: 76)  
01524845 2611411  
Identification of flagellar and associated polypeptides of  
Helicobacter (formerly Campylobacter) pylori .

7/6/4 (Item 1 from file: 143)  
0517714 H.W. WILSON RECORD NUMBER: BBAI95012523  
Identification of a 29 kDa flagellar sheath protein in  
Helicobacter pylori using a murine monoclonal antibody

7/6/5 (Item 1 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.  
An OspA-based DNA vaccine protects mice against infection with  
Borrelia burgdorferi

7/6/6 (Item 2 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.  
Immunization of mice with recombinant lipoproteins OspA and  
OspD of Borrelia burgdorferi, the agent of Lyme disease

7/6/7 (Item 3 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.  
Identification of a 29 kDa flagellar sheath protein in  
Helicobacter pylori using a murine monoclonal antibody

7/6/8 (Item 4 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.  
Identification of flagellar and associated polypeptides of  
Helicobacter (formerly Campylobacter) pylori  
? t s7/5/1

7/5/1 (Item 1 from file: 76)

DIALOG(R) File 76:Life Sciences Collection  
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02121662 4026396

An OspA-based DNA vaccine protects mice against infection with  
*Borrelia burgdorferi*

Luke, C.J.; Carner, K.; Liang, Xiaowu; Barbour, A.G.

Dep. Microbiol. and Mol. Genet., Univ. California, Irvine, CA  
92697-4025, USA

J. INFECT. DIS. vol. 175, no. 1, pp. 91-97 (1997)

ISSN: 0022-1899

DOCUMENT TYPE: Journal article LANGUAGE: ENGLISH

SUBFILE: Microbiology Abstracts B: Bacteriology; Immunology  
Abstracts; Medical and Pharmaceutical Biotechnology Abstracts

Immunization with recombinant OspA protein of *Borrelia burgdorferi* protects against experimental Lyme disease. In the present study, mice were injected intramuscularly with plasmid DNA (VR2210) encoding strain B31 OspA. In this vector, the ospA-coding sequence was under transcriptional control of the cytomegalovirus immediate early promoter. For negative and positive controls, mice were immunized with either the plasmid vector without an osp-coding sequence or recombinant OspA protein, respectively. Mice immunized with VR2210 DNA produced OspA-specific antibodies that bound to *B. burgdorferi* in a whole cell ELISA and inhibited the growth of a homologous strain of *B. burgdorferi*. Immunization with VR2210 protected mice against challenge with 2 infectious strains of *B. burgdorferi*, Sh-2-82 and N40. These results indicate that vaccination with plasmid DNA expressing OspA is an efficacious method for providing a protective response against *B. burgdorferi* infection.

DESCRIPTORS: *Borrelia burgdorferi*; Lyme disease; vaccines;  
immunization; DNA; plasmids; mice; OspA protein

SECTION HEADING: 02834 -- Vaccination and immunization; 06807 --  
Active immunization; 33365 -- Vaccines  
? display sets

Set	Items	Description
S1	3059	(OSPA OR OSP(2W)A)
S2	3059	(OSPA OR OSP(2W)A)
S3	38	S1(20N) (MUCOS? OR ORAL? OR INTRANAS?)
S4	1766	S2 NOT PY>1994
S5	12	RD S3 (unique items)
S6	18	S4(30N)ORAL?
S7	8	E1, E6, E11, E12

? s s4(30n) (oral? or mouth? or mucos?)

Processing

Processed 10 of 36 files ...

Processing

Processing

Processed 20 of 36 files ...

Processing  
Processed 30 of 36 files ...  
Processing  
Completed processing all files

1766 S4  
1503443 ORAL?  
362793 MOUTH?  
490780 MUCOS?  
S8 20 S4(30N) (ORAL? OR MOUTH? OR MUCOS?)  
? t s8/6/1-20

8/6/1 (Item 1 from file: 5)  
11156307 BIOSIS Number: 97356307  
Treatment of Lyme arthritis  
Print Number: Biological Abstracts Vol. 098 Iss. 004 Ref.  
044796

8/6/2 (Item 2 from file: 5)  
9043846 BIOSIS Number: 93028846  
PROTECTION OF MICE FROM LYME BORRELIOSIS BY ORAL VACCINATION  
WITH ESCHERICHIA-COLI EXPRESSING OSPA

8/6/3 (Item 1 from file: 73)  
9241201 EMBASE No: 94188762  
Treatment of Lyme arthritis

8/6/4 (Item 2 from file: 73)  
8347903 EMBASE No: 92022159  
Protection of mice from lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA

8/6/5 (Item 1 from file: 76)  
01834923 3622346  
Treatment of Lyme arthritis

8/6/6 (Item 2 from file: 76)  
01536258 2634889  
Protection of mice from lyme borreliosis by oral vaccination with  
Escherichia coli expressing OspA.

8/6/7 (Item 1 from file: 144)  
10569098 PASCAL No.: 93-0078350  
Protection of mice from lyme borreliosis by oral vaccination  
with Escherichia coli expressing OspA

8/6/8 (Item 1 from file: 155)  
07940350 94271287

Treatment of Lyme arthritis.

8/6/9 (Item 2 from file: 155)  
06874301 92065008

Protection of mice from Lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA.

8/6/10 (Item 1 from file: 156)  
02456955 Subfile: TOXBIB-94-271287  
Treatment of Lyme arthritis.

8/6/11 (Item 1 from file: 173)  
00308876 800323613  
TITLE: Systemic and mucosal immunity induced by BCG  
vector expressing outer-surface protein A of  
Borrelia burgdorferi.

8/6/12 (Item 1 from file: 377)  
00620253 DERWENT ACCESSION NUMBER: 95-01917  
Systemic and mucosal immunity induced by BCG vector expressing  
outer-surface protein A of Borrelia burgdorferi.

8/6/13 (Item 2 from file: 377)  
00468242 DERWENT ACCESSION NUMBER: 92-08732  
Protection of Mice from Lyme Borreliosis by Oral Vaccination with  
Escherichia coli Expressing OspA.

8/6/14 (Item 1 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.

Systemic and mucosal immunity induced by BCG vector expressing  
outer-surface protein A of Borrelia burgdorferi

8/6/15 (Item 2 from file: 399)  
DIALOG(R)File 399:(c) 1997 American Chemical Society. All rts.  
reserv.

Protection of mice from lyme borreliosis by oral vaccination  
with Escherichia coli expressing OspA

8/6/16 (Item 1 from file: 434)  
13521788 Genuine Article#: PW082 Number of References: 26  
Title: SYSTEMIC AND MUCOSAL IMMUNITY INDUCED BY BCG VECTOR  
EXPRESSING OUTER-SURFACE PROTEIN-A OF BORRELIA-BURGDORFERI  
(Abstract Available)

8/6/17 (Item 2 from file: 434)

13116461    Genuine Article#: NP654    Number of References: 34  
Title: TREATMENT OF LYME ARTHRITIS    (Abstract Available)

8/6/18        (Item 3 from file: 434)  
11224104    Genuine Article#: GR660    Number of References: 10  
Title: PROTECTION OF MICE FROM LYME BORRELIOSIS BY ORAL  
VACCINATION WITH        ESCHERICHIA-COLI EXPRESSING OSPA    (Abstract  
Available)

8/6/19        (Item 1 from file: 35)  
01213335    ORDER NO: AAD92-11404  
DETECTION OF SPECIES-SPECIFIC DNA SEQUENCES OF BORRELIA  
BURGDORFERI IN INFECTED HUMANS, ANIMAL RESERVOIRS, AND IXODID  
TICK VECTORS (LYME DISEASE)

8/6/20        (Item 1 from file: 50)  
02600148    CAB Accession Number: 920511740  
Protection of mice from Lyme borreliosis by oral  
vaccination with Escherichia coli expressing OspA.  
? t s8/5/11,14,16

8/5/11        (Item 1 from file: 173)  
DIALOG(R)File 173:Adis LMS Drug Alerts  
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00308876                    800323613  
TITLE:                    Systemic and mucosal immunity induced by BCG  
vector                    expressing outer-surface protein A of  
Borrelia                    burgdorferi.  
AUTHOR:                    Langermann S; Palaszynski S; Sadziene A; Stover  
C K;                    Koenig S  
CORPORATE SOURCE: MedImmune, Gaithersburg, Maryland, USA.  
JOURNAL:                    Nature (Nature) 372: 552-555, 8 Dec 1994.  
PUBLICATION DATE: 8 December 1994 (19941208)  
LANGUAGE:                    English  
ADIS TITLE:                    Lyme disease vaccine: immunogenicity.  
Intranasal                    administration of BCG expressing  
OspA of Borrelia                    burgdorferi induces both  
systemic and mucosal immunity                    Animal study.  
ADIS LMS:                    Vaccines (Summary): Alert no. 2, 1995  
RECORD TYPE:                    Summary  
DOCUMENT TYPE:                    Animal

SUMMARY TEXT:

Purpose:

Results from a previous study have shown that parenteral  
administration of recombinant BCG expressing Borrelia burgdorferi  
outer surface protein A (rBCG-OspA)  $2 \times 10^6$  cfu induced  
high levels of protective anti-OspA IgG antibodies (Stover CK, et  
al. Journal of Experimental Medicine 178: 197-209, 1 Jul 1993).  
The present study examined the systemic and mucosal  
immunogenicity of intranasal administration of this Lyme disease